

# The African Climate & Development Initiative

## Research Report 2015

**Director and Pro Vice-Chancellor:  
Professor Mark New**

### Initiative Profile

The African Climate & Development Initiative (ACDI) is UCT's active response to the climate change and development challenge. A one-stop shop for all the activities happening around climate change at the University, the ACDI was set up in 2011 by Vice-Chancellor Max Price as one of four strategic initiatives, along with the Safety and Violence Initiative, the Schools Improvement Initiative, and the Poverty & Inequality Initiative. The ACDI is also one of the Vice-Chancellor's signature themes which are chosen to drive research in a strategic manner, are grounded in existing areas of internationally-recognized excellence at UCT, and are aligned to institutional, regional and national priorities.

Although the ACDI draws on membership from across all faculties at UCT, it is hosted by the Science Faculty, which provides administrative (HR and Financial) and academic (Student Administration) support, as well as office space.

The ACDI's vision is to promote a developing world that has transitioned to a sustainable growth trajectory and has the capacity to mitigate and adapt to climate change and its related issues. To achieve this, the ACDI focuses its efforts on collaboration and inter-disciplinarity, and is working to coordinate and grow what is already the largest concentration of expertise on climate change and sustainable development within Africa.

The ACDI supports research in three broad thematic areas, namely: mitigation (and low carbon development); vulnerability, impacts and adaptation; and climate and natural science, within the overarching theme of sustainable and climate compatible development. Within UCT, the ACDI merges these climate change issues with development issues, bringing together UCT's breadth

and depth of research and teaching in these areas, which were previously conducted largely in isolation within a variety of departments and research centres. Beyond UCT, the ACDI brings together academics, NGOs, business and government to collectively tackle Africa's climate and development challenges.

Since its inception in 2011 the number of ACDI staff has doubled - starting as a small working group of five people in 2011, the ACDI now employs 22 staff members who engage in research, teaching, support and management. ACDI convenes a flagship interdisciplinary Masters in Climate Change and Sustainable Development, and supports research masters and doctoral students through ACDI projects and programme.

### Initiative Statistics

#### Permanent and Contract Staff

Professor	1
Contract Research Staff	1
Administrative and Support Staff	8
Project Staff	6
<b>Total</b>	<b>16</b>

#### Affiliated Researchers

Research Chairs and Fellows	7
Research Associates	38
<b>Total</b>	<b>45</b>

#### Postdoctoral Fellows

Postdoctoral Fellows	<b>4</b>
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### Research Fields and Staff

#### Permanent and Contract Research Staff

##### **PROFESSOR MARK NEW**

Director and Pro Vice-Chancellor

Observed climate change detection and attribution, Climate model evaluation and climate scenario development, Climate impacts assessment and adaptation planning, Water resources, agriculture, biodiversity and nexus issues, Decision making under uncertainty, Interdisciplinary research methodologies and approaches

### **DR MARIE-ANGE BAUDOIN**

Lecturer and Masters Course Convener (Climate Change Adaptation and Disaster Risk Reduction), with a specific focus on sub-Saharan Africa.

### **Administrative and Support Staff**

#### **KAREN FOSSEUS**

Administrative Manager

#### **RABIA KARRIEM**

Administrative Assistant

#### **NOMABELU SOMATUBE**

Senior Secretary and Personal Assistant

#### **KIRSTY NORTJE**

Project Coordinator & Research Officer

#### **LEIGH COBBAN**

Project Development and Research Officer

#### **ZOË VISSER**

Project designer and Coordinator

#### **ALICIA OKEYO**

Communications Assistant

#### **KATRINE CLAASSENS**

Communications Assistant

### **Project Staff**

#### **DR DIAN SPEAR**

Regional Research Lead (ASSAR Project)

#### **LUCIA SCODANNIBIO**

Research Consortium Manager (ASSAR Project)

#### **DR TALI HOFFMAN**

Communications Officer (ASSAR Project)

#### **NICHOLAS REAY**

Website and Communications Manager (ASSAR Project)

#### **DR STEPHANIE MIDGLEY**

Project Manager (SmartAgri Project)

#### **ROLAND HUNTER**

Technical project manager ("Enhancing the Capacity of African Countries to Use Climate Information to Inform Decision-Making" project) Climate Change resilience and Adaptation

### **Research Chairs and Fellows**

#### **PROFESSOR RALPH HAMANN, GRADUATE SCHOOL OF BUSINESS**

Organisational transformative change and sustainability

#### **PROFESSOR MARTINE VISSER, DEPARTMENT OF ECONOMICS**

Environmental Economics

#### **DR BRITTA RENNKAMP, ENERGY RESEARCH CENTRE**

Climate technology and policy in developing countries, mitigation and poverty

#### **DR LORENA PASQUINI**

Research Fellow (Urban ARK Project) Urban Climate Risk, climate change adaptation, and climate change decision- and policy-making

#### **ASSOCIATE PROFESSOR RES ALTWEGG, DEPARTMENT OF STATISTICS**

Statistics in Ecology, Environment and Conservation

#### **ASSOCIATE PROFESSOR GINA ZIERVOGEL, ENVIRONMENTAL AND GEOGRAPHICAL SCIENCES DEPARTMENT**

Climate change vulnerability and adaptation, urban governance and participatory research

#### **PROFESSOR CLIFFORD SHEARING, CENTRE FOR CRIMINOLOGY**

Environmental and physical security governance, risk and regulation.

### **Postdoctoral Fellows**

#### **DR ADMIRE NYAMWAZA**

Community-based approaches to climate change adaptation

#### **DR SALMA HEGGA**

Change Vulnerability, Adaptation and Governance

#### **DR MODATHIR ZAROUG**

Climate Change Projections and Scenarios

#### **DR NADINE MENTHER**

Natural resource management, climate change adaptation and mitigation in the agricultural sector.

### **Contact Details**

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## RESEARCH OUTPUT

### Chapters in books

Berg, J. and Shearing, C. 2015. New authorities: relating state and non-state security auspices in South African improvement districts. In P. Albrecht and H.M. Kayed (eds), *Policing and the Politics of Order-Making*, pp. 91-107. Abingdon, Oxon: Routledge. ISBN 9780415743303.

Bitzer, V. and Hamann, R. 2015. The business of social and environmental innovation. In V. Bitzer, R. Hamann, M. Hall and E. Wosu Griffin-EL (eds), *The Business of Social and Environmental Innovation*, pp. 3-24. Switzerland: Springer International Publishing. ISBN 9783319040509.

Bland, C. and Hamann, R. 2015. Obstacles to firms' adoption of socially embedded approaches to BoP markets. In V. Bitzer, R. Hamann, M. Hall and E. Wosu Griffin-EL (eds), *The Business of Social and Environmental Innovation*, pp. 105-127. Switzerland: Springer International Publishing. ISBN 9783319040509.

Froestad, J., Shearing, C. and Van der Merwe, M. 2015. Criminology: re-imagining security and risk. In P. Bourbeau (ed), *Security: Dialogue across Disciplines*, pp.177-195. UK: Cambridge University Press. ISBN 9781107514737.

McLachlan, M., Hamann, R., Sayers, V., Kelly, C. and Drimie, S. 2015. Fostering innovation for sustainable food security: the Southern Africa Food Lab. In V. Bitzer, R. Hamann, M. Hall and E. Wosu Griffin-EL (eds), *The Business of Social and Environmental Innovation*, pp. 163-181. Switzerland: Springer International Publishing. ISBN 9783319040509.

Methner, N., Hamann, R. and Nilsson, W. 2015. The evolution of a sustainability leader: the development of strategic and boundary spanning organizational innovation capabilities in Woolworths. In V. Bitzer, R. Hamann, M. Hall and E. Wosu Griffin-EL (eds), *The Business of Social and Environmental Innovation*, pp. 87-104. Switzerland: Springer International Publishing. ISBN 9783319040509.

### Articles in peer-reviewed journals

Altwegg, R., De Klerk, H.M. and Midgley, G.F. 2015. Fire-mediated disruptive selection can explain the reseed-resprouter dichotomy in Mediterranean-type vegetation. *Oecologia*, 177(2): 367-377.

Baudoin, M.A. and Wolde-Georgis, T. 2015. Disaster risk reduction efforts in the greater horn of Africa. *International Journal of Disaster Risk Science*, 6(1): 49-61.

Brick, K. and Visser, M. 2015. Risk preferences, technology adoption and insurance uptake: a framed experiment. *Journal of Economic Behavior & Organization*, 118: 383-396.

Brick, K. and Visser, M. 2015. What is fair? An experimental guide to climate negotiations. *European Economic Review*, 74: 79-95.

Broms, K.M., Hooten, M.B., Johnson, D.S., Altwegg, R. and Conquest, L.L. 2015. Dynamic occupancy models for explicit colonization processes. *Ecology*, 97(1): 194-204.

Bussière, E., Underhill, L.G. and Altwegg, R. 2015. Patterns of bird migration phenology in South Africa suggest northern hemisphere climate as the most consistent driver of change. *Global Change Biology*, 21(6): 2179-2190.

Clark, K.E., West, A.J., Hilton, R.G., Asner, G.P., Quesada, C. A., Silman, M.R., Saatchi, S.S., Farfan-Rios, W., Martin, R.E., Horwath, A.B., Halladay, K., New, M. and Malhi, Y. 2015. Storm-triggered landslides in the Peruvian Andes and implications for topography, carbon cycles, and biodiversity. *Earth Surface Dynamics Discussions*, 3: 631-688.

de la Poterie, A.T. and Baudoin, M.A. 2015. From Yokohama to Sendai: approaches to participation in international disaster risk reduction frameworks. *International Journal of Disaster Risk Science*, 6(2): 128-139.

Dieppo, B., Rouault, M. and New, M. 2015. The impact of ENSO on Southern African rainfall in CMIP5 ocean atmosphere coupled climate models. *Climate Dynamics*, 45(9-10): 2425-2442.

Evans, D.M., Altwegg, R., Garner, T.W.J., Gompper, M.E., Gordon, I.J., Johnson, J.A. and Pettorelli, N. 2015. Biodiversity offsetting: what are the challenges, opportunities and research priorities for animal conservation? *Animal Conservation*, 18(1): 1-3.

Faulkner, K.T., Spear, D., Robertson, M.P., Rouget, M. and Wilson, R.J.U. 2015. An assessment of the information content of South African alien species databases. *Bothalia*, 45(1): 11pp. DOI: 10.4102/abc.v45i1.1103.

Froestad, J., Grimwood, S., Herbstein, T. and Shearing, C. 2015. Policy design and nodal governance: a comparative analysis of determinants of environmental policy change in a South African city. *Journal of Comparative Policy Analysis: Research and Practice*, 17(2): 174-191.

Fujisawa, M., Kobayashi, K., Johnston, P. and New, M. 2015. What Drives farmers to make top-down or bottom-up adaptation to climate change and fluctuations? A comparative study on 3 cases of

- apple farming in Japan and South Africa. *PLoS ONE*, 10(3): e0120563(16pp). DOI: 10.1371/journal.pone.0120563.
- Garcia, R.A., Cabeza, M., Altwegg, R. and Araújo, M.B. 2015. Do projections from bioclimatic envelope models and climate change metrics match? *Global Ecology and Biogeography*, 25(1), 65-74.
- Hegerl, G.C., Black, E., Allan, R.P., Ingram, W.J., Polson, D., Trenberth, K.E. and Zhang, X. 2015. Challenges in quantifying changes in the global water cycle. *Bulletin of the American Meteorological Society*, 96(7): 1097-1115.
- Honig, M., Petersen, S., Herbstein, T., Roux, S., Nel, D. and Shearing, C. 2015. A conceptual framework to enable the changes required for a one-planet future. *Environmental Values*, 24(5): 663-688.
- Honig, M., Petersen, S., Shearing, C., Pintér, L. and Kotze, I. 2015. The conditions under which farmers are likely to adapt their behaviour: a case study of private land conservation in the Cape Winelands, South Africa. *Land Use Policy*, 48: 389-400.
- Jansen, D.Y., Wilson, A.M. and Altwegg, R. 2015. Climatic influences on survival of migratory African reed warblers *Acrocephalus baeticatus* in South Africa. *Ardea*, 103(2): 163-174.
- Karmacharya, J., Levine, R.C., Jones, R., Moufouma-Okia, W. and New, M. 2015. Sensitivity of systematic biases in South Asian summer monsoon simulations to regional climate model domain size and implications for downscaled regional process studies. *Climate Dynamics*, 45(1): 213-231.
- Louw, E.L., Hoffman, E.W., Theron, K.I., and Midgley, S.J.E. 2015. Physiological and phenological responses of *Protea 'Pink Ice'* to elevated temperatures. *South African Journal of Botany*, 99: 93-102.
- Measey, G.J., Vimercati, G., de Villiers, F.A., Mokhatla, M.M., Davies, S.J., Edwards, S. and Altwegg, R. 2015. Frog eat frog: exploring variables influencing anurophagy. *PeerJ*, 3(1204): 16pp. DOI: **10.7717/peerj.1204**.
- Mecenero, S., Altwegg, R., Colville, J.F. and Beale, C.M. 2015. Roles of spatial scale and rarity on the relationship between butterfly species richness and human density in South Africa. *PLoS ONE*, 10(4), e0124327(18pp). DOI: 10.7717/peerj.1204.
- Nyamwanza, A., Kayhan, A.K., Pandit, M.K., Haque, A., Riedy, C., Doherty-Bigara, J., Galarraga, I. and Dingman, E. 2015. The big question: climate's biggest losers who has the most to lose from climate change in your country? *World Policy Journal*, 32(2): 3-7.
- Nyamwanza, A.M. and Bhatasara, S. 2015. The utility of postmodern thinking in climate adaptation research. *Environment, Development and Sustainability*, 17(5): 1183-1196.
- Oosthuizen, W.C., Bester, M.N., Altwegg, R., McIntyre, T. and De Bruyn, P.J. 2015. Decomposing the variance in southern elephant seal weaning mass: partitioning environmental signals and maternal effects. *Ecosphere*, 6(8): 1-22.
- O'Riordan, T., McGowan, A., Hamann, R., Lahsen, M. and Zhang, L. 2015. The legacy of the Papal Encyclical. *Environment: Science and Policy for Sustainable Development*, 57(6): 2-5.
- Pasquini, L., Ziervogel, G., Cowling, R.M. and Shearing, C. 2015. What enables local governments to mainstream climate change adaptation? Lessons learned from two municipal case studies in the Western Cape, South Africa. *Climate and Development*, 7(1): 60-70.
- Pasquini, L. and Cowling, R.M. 2015. Opportunities and challenges for mainstreaming ecosystem-based adaptation in local government: evidence from the Western Cape, South Africa. *Environment, Development and Sustainability*, 17(5): 1121-1140.
- Péron, G. and Altwegg, R. 2015. Departures from the energy-biodiversity relationship in South African passerines: are the legacies of past climates mediated by behavioral constraints on dispersal? *PLoS ONE*, 10(7): e0133992(17pp). DOI: **10.1371/journal.pone.0133992**.
- Péron, G. and Altwegg, R. 2015. Low bird diversity in the Fynbos plant diversity hotspot: quaternary legacies in the current distributions of passerine birds. *Ecography*, 38(10): 992-997.
- Péron, G. and Altwegg, R. 2015. The abundant centre syndrome and species distributions: insights from closely related species pairs in southern Africa. *Global Ecology and Biogeography*, 24(2): 215-225.
- Péron, G. and Altwegg, R. 2015. Twenty-five years of change in southern African passerine diversity: nonclimatic factors of change. *Global Change Biology*, 21(9): 3347-3355.
- Petersen, S., Shearing, C. and Nel, D. 2015. Sustainability transitions: an investigation of the conditions under which corporations are likely to reshape their practices to reverse environmental degradation. *Environmental Management and Sustainable Development*, 4(1): 2164-7682.
- Reddy, C.D., Hamann, R. and Urban, B. 2015. Country-level entrepreneurship: crowding out the population's need for autonomy. *Acta Commercii*, 15(1): 8pp. DOI: 10.4102/ac.v15i1.292.
- Rennkamp, B. and Boyd, A. 2015. Technological capability and transfer for achieving – South Africa's

low carbon development goals. *Climate Policy*, 15(1): 12-29.

Salguero-Gómez, R., Jones, O.R., Archer, C.R., Buckley, Y.M., Che-Castaldo, J., Caswell, H., Hodgson, D., Scheuerlein, A., Conde, D.A., Brinks, E., Buhr, H., ... Altwegg, R, et al. 2015. The COMPADRE Plant Matrix Database: an open online repository for plant demography. *Journal of Ecology*, 103(1): 202-218.

Shackleton, S., Ziervogel, G., Sallu, S., Gill, T. and Tschakert, P. 2015. Why is socially-just climate change adaptation in sub-Saharan Africa so challenging? A review of barriers identified from empirical cases. *Wiley Interdisciplinary Reviews: Climate Change*, 6(3): 321-344.

Shearing, C. 2015. Criminology and the Anthropocene. *Criminology and Criminal Justice*, 15(3): 255-269.

Shearing, C. 2015. Reflections on the nature of policing and its development. *Police Practice and Research: An International Journal*, 17(1): 84-94.

Sherley, R. B., Winker, H., Altwegg, R., van der Lingen, C.D., Votier, S.C. and Crawford, R.J. 2015. Bottom-up effects of a no-take zone on endangered penguin demographics. *Biology Letters*, 11(7): 4pp. DOI: **10.1098/rsbl.2015.0237**.

Tibesigwa, B., Visser, M. and Turpie, J. 2015. The impact of climate change on net revenue and food adequacy of subsistence farming households in South Africa. *Environment and Development Economics*, 20(03): 327-353.

Visser, M. and Burns, J. 2015. Inequality, social sanctions and cooperation within South African fishing communities. *Journal of Economic Behavior & Organization*, 118: 95-109.

Winkler, H., Boyd, A., Gunfaus, M.T. and Raubenheimer, S. 2015. Reconsidering development by reflecting on climate change. *International Environmental Agreements: Politics, Law and Economics*, 15(4): 369-385.

### **Peer-reviewed published conference proceedings**

Dieppois, B., Pohl, B., Rouault, M., New, N., Keenlyside, N. and Lawler, D. 2015. Decadal variability of summer Southern African rainfall. *Proceedings of 31st Annual Conference of the South African Society for Atmospheric Sciences*, 21-22 September 2015, Hennops River Valley, South Africa. South Africa: South African Society for Atmospheric Sciences (SASAS). ISBN 9780620678254.